

REMARKS

Claim Objection

Claims 10-27 have been re-numbered claims 28-48, and the dependencies have been re-numbered accordingly. The dependency of claim 30 has been amended: it depends now on claim 29; furthermore it has been specified that the starchy material is "sulfonated", and such an addition is based on page 6 lines 10-12. Furthermore, "wherein it is" has been cancelled in claims 34 to 39. In claim 44, the passage "as claimed in claim ~~10~~ 29" has been made dependent of "composition", and not of "employed". In claim 42, "one of the starchy materials" has been amended into "at least one of the cationic and sulfonated starchy materials", and such an amendment is based on page 9 lines 7-8. In claim 46, "one or more steps" has been amended into "at least one step", and such an amendment is based on page 9 lines 18-21 and on the obvious meaning of "one or more".

Claims rejections under 35 USC 112

It is respectfully submitted that the invention as claimed now fulfils the requirements of 35 USC§112.

Claims rejections under 35 USC 102 Novelty

Claims 10-27 have been rejected under 35USC§102(b) as anticipated by GOSSET (5,129,989).

This rejection is respectfully traversed.

The prior art document GOSSET, by the way of its corresponding European patent application EP-0.282.415, has been disclosed in the specification on page 3 lines 6-14. It is stated that "Techniques have also been exploited known as "dual" techniques, in which there are added successively in any order, a cationic polymer and an anionic compound of inorganic or organic origin. Such a technique, that must use a cationic starch and an anionic starch separately, is described in particular in patent EP 282 415 in the name of the Applicant. This process enables starches to be firmly bound but has the main disadvantage in practice of making it necessary to use two cooking installations, one for solubilizing the cationic starch and the other for solubilizing the anionic starch. Moreover, the total quantity of starches bound to the cellulose is not always sufficient to give the paper the desired physical properties." (Highlights added)

As explained above, the process disclosed in the prior art document GOSSET does not describe at all a process according to the invention comprising the introduction of a composition comprising (simultaneously) cationic and anionic starches. It is not described either such a composition.

The basis in such a document for the introduction of the starches **separately from one another** is for example in the abstract, on column 3 lines 12 and 22, on column 15 line 10. Furthermore this introduction is carried out on "**separately from one another** at at least two point of [the] installation" (see column 15, line 11 and examples), either "**sequential**" (see column 9, line 54 and column 13, line 66) or "**successive(ly)**" (see column 11, line 18 and column 12 line 66 and column 15, line 9). The examples of this document GOSSET always describe an introduction of the cationic starch **before** the introduction of the anionic starch, in the element 8 of

the FIGURE, whereas the anionic starch is introduced in the element 12 of the Figure. Thereby the "time contact" between the cationic starch and the fiber suspension is of a duration (exemplified as 5 minutes - see column 8 line 67 and column 12 line 31 and column 13 line 44 and column 14 line 42) longer than the "time contact" between the anionic starch and the fiber suspension (exemplified as 30 seconds - see column 9 line 2 and column 12 line 33 and column 13 line 46 and column 14 line 45).

Hence the invention as claimed is new versus the document GOSSET.

Concerning the inventive step of the invention versus the document GOSSET, it can be underlined that the Applicant has found "in particular that by carefully selecting the nature of the anionic starchy material used in such a process, it was possible to improve still further the bonding of starches and/or the retention of fibers and fillers within the resulting plane structure as well as the physical properties of this structure. This was without it being absolutely necessary to put into practice pH and cooking conditions made necessary by the teachings of the prior art" (highlights added, see page 4 lines 17 to 22). The example 1 of the invention as described from page 9 to page 12 of the specification show clearly that some other anionic starches such as succinylated starches (composition B of such an example) or phosphated starches (composition C of such an example) do not show such good technical effects. Moreover, the particularly good technical effects of the composition according to the invention are obtained "for all levels of introduction studied" (see page 12 lines 24-26), that is to say at introduction levels of 4%, 6% and 8%. It was not at all obvious to find that the new compositions according to the

invention "made it possible to achieve remarkably high levels of bonding of starches and of total retention, even with a difficult pulp (old papers) and at relatively high levels of introduction (6 and 8 %)" (see page 12 lines 27-29), and that such compositions "could thus be advantageously used to improve the physical properties, in particular the internal cohesion of papers obtained and this without risk of large losses of starchy and fibrous materials in the white water." (See page 12 lines 29-32). On page 14 from lines 3 to 9 it is also stated, in the examples, that "Such compositions may in particular be effectively used under difficult conditions (pulp with 100 % old papers) and for relatively high levels of use, for example between 4 and 10 %.

It is thus possible to envisage dispensing with all or part of any surface treatment applied in the prior art to achieve physical properties of the same order."

Another interest of the compositions according to the invention is to increase "the level of inorganic fillers in the paper at the expense of fibers (more costly raw material than fillers)" and to compensate "for the resulting reduction in the physical properties of the paper by a supplementary addition of starches" (see pages 14 lines 10-14).

The examples described in the document GOSSET deal with the industrial practice, in which the total level of starches is less than 3% by weight versus the fibers (dry/dry). In the examples of the document GOSSET, when the anionic starch is a sulfonated starch such as VECTOR® A 180, the level of starches as explained above is

- In Test 3 of example 1, of 2.5% (1% + 1.5%)
- In Test 16 of example 3, of 2.96% (2% + .96%)
- In Test 19 of example 4, of 1.86% (1.2% + .66%).

Then it can be seen from Tables I, V and VI in such a document that the more is a total level of starches, the less

the first pass retention and/or the filler retention is low. That is to say that the one skilled in the art considering the use (separately as the document GOSSET teaches it) of a cationic starch and a sulfonated anionic starch does not intend to use it because, in terms of levels (total level of starches as explained above), the more starches there are the less the property of retention is good.

Furthermore, in example 2 according to the invention, it is *showed (and proved)* that, even for a highly flocculated composition E, "the results obtained revealed, compared with a control paper with no starch size addition:

- An increase in internal cohesion from 40 % (rate of introduction: 4 %) to 90 % (rate of introduction: 8 %)
- A corresponding increase in bursting strength from 25 to 48 %.

In addition, a study of the influence of COMPOSITION E on the total degree of retention gave, in the present case, results that were equal to or slightly below those observed with a pulp without an addition of starch size. These particular results were judged to be satisfactory overall taking into account in particular the nature of the pulp.

These results confirm the value of compositions according to the invention as a means for the internal treatment of paper, in particular with a view to improving the physical properties." (See from page 13 line 2 to page 14 line 7).

In example 2 according to the invention, from page 14 line 14 line 15 to page 15 line 27), were carried out also some "Complementary tests using a composition according to the invention (COMPOSITION F or G)."

"These tests confirmed overall the results and conclusions of the previously described test, particularly in terms of a very significant improvement in internal cohesion and the burst index of the papers obtained.

Moreover, these tests also showed a very significant improvement (i.e. at least 20 %) in the "CMT 30" values obtained on paper of the covering type for a corrugated board.

It should be recalled that the "CMT 30" index is particularly suitable for evaluating a fluted paper for corrugated board and in particular for determining the flat compression strength of such a paper.

It is also noteworthy that improvements in the "CMT 30" index were obtained on a covering paper while the paper machine on this occasion was not adjusted for the production of such a paper.

As a result of this, the use of a composition according to the invention makes it possible to envisage gains in CMT of at least 20 %, and this for all types of papers for corrugated board (covering and fluted).

This is all the more surprising considering that, as the Applicant has found, such gains do not harm the other properties of such papers (porosity, wetability, etc.) nor the subsequent use of such papers in board making. Now, such harmful effects are generally encountered with papers surface treated in a "size press".

This confirms the value of compositions according to the invention within the aim of totally or partially dispensing with devices of the "size press" type." (Highlights added)

On example 3 of the specification, the interest of a composition according to the invention (composition H) is shown in the manufacture of an emulsion "perfectly stable and homogeneous". Such an emulsion has not even been suggested in the document GOSSET.

One can also point out that the document GOSSET was published more than ten years before the priority date of the invention, as a hint for inventive step.

Hence the invention as claimed is inventive versus the document GOSSET.

As a conclusion, it is hence respectfully submitted that the objection under 35USC§102(b) be withdrawn and that the Application is now in proper form for allowance.

Respectfully submitted,

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